

IN THE CLAIMS:

Claims 1-13 and 43-47 have been amended herein. Please add new claim 48. Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) ~~An energetic thermoplastic elastomer having A blocks and B blocks and being present in a substantially solid state suitable for use as a binder for at least one of a propellant, explosive, and gasifier, the energetic thermoplastic elastomer being formed from a composition comprising, as constituents~~elastomer, comprising:

A blocks terminated with isocyanate-reactive groups derived from monomers comprising one or more oxetane derivatives, the A blocks being crystalline below about 60°C;

B blocks terminated with isocyanate-reactive groups derived from monomers comprising at least one member selected from the group consisting of oxirane and derivatives thereof, the B blocks being amorphous above about -20°C; and

linking groups derived from at least one diisocyanate and at least one linking compound comprising two functional groups which are reactive with isocyanate moieties of the at least one diisocyanate,

wherein the energetic thermoplastic elastomer has a density ranging from approximately 1.31 g/cm³ to approximately 1.42 g/cm³.

2. (Currently Amended) ~~An~~The energetic thermoplastic elastomer as defined in claim 1, wherein:

the at least one diisocyanate contains a first isocyanate moiety which is at least five times more reactive with the terminal groups of the A blocks and the B blocks than a second isocyanate moiety thereof, ~~whereby~~wherein the more reactive first isocyanate moiety is capable of reacting

with and end capping the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

the at least one linking compound has two isocyanate-reactive groups which are sufficiently sterically unhindered to be reactive with the free and unreacted second isocyanate moieties of the end-capped blocks.

3. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 2, wherein the at least one diisocyanate comprises 2,4-toluene diisocyanate.

4. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the A blocks are crystalline below about 75°C.

5. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the A blocks comprise homopolymers, copolymers, or terpolymers derived from one or more symmetrically-substituted oxetane monomers comprising at least one member selected from the group consisting of 3,3-bis(methylnitraminomethyl)oxetane and 3,3-bis(azidomethyl)oxetane.

6. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the B blocks comprise difunctional glycidyl azide polymer.

7. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the B blocks comprise poly(glycidyl nitrate).

8. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the energetic thermoplastic elastomer has a weight average molecular weight of at least 40,000 and a number average molecular weight of at least 10,000.

9. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the energetic thermoplastic elastomer has a weight average molecular weight of at least 60,000 and a number average molecular weight of at least 12,000.

10. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the energetic thermoplastic elastomer has a weight average molecular weight of at least 80,000 and a number average molecular weight of at least 15,000.

11. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein a weight ratio of A blocks to B blocks is between about 15:85 to about 40:60.

12. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 1, wherein the isocyanate-reactive terminal groups of the A blocks and the B blocks are hydroxyl groups.

13. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer of claim 1, wherein the isocyanate-reactive terminal groups of the B blocks are secondary hydroxyl groups.

14-42. (Canceled)

43. (Currently Amended) ~~An energetic thermoplastic elastomer having A blocks and B blocks and being present in a substantially solid state suitable for use as a binder for at least one of a propellant, explosive, and gasifier, the energetic thermoplastic elastomer being formulated from a composition comprising, as constituents~~ elastomer, comprising:

A blocks terminated with isocyanate-reactive groups derived from monomers comprising at least one member selected from the group consisting of 3,3-bis(ethoxymethyl)oxetane, 3,3-bis(chloromethyl)oxetane, 3,3-bis(methoxymethyl)oxetane, 3,3-bis(fluoromethyl)oxetane, 3,3-bis(acetoxymethyl)oxetane, 3,3-bis(hydroxymethyl)oxetane, 3,3-bis(methoxyethoxymethyl)oxetane, 3,3-bis(iodomethyl)oxetane, 3,3-bis(nitratomethyl)oxetane,

3,3-bis(methylnitraminomethyl)oxetane, and 3,3-bis(azidomethyl)oxetane, the A blocks being crystalline below about 60°C;

B blocks terminated with isocyanate-reactive groups and comprising at least one member selected from the group consisting of glycidyl azide polymer and poly(glycidyl nitrate), the B blocks being amorphous above about -20°C; and

linking groups derived from at least one diisocyanate and at least one linking compound comprising two functional groups which are reactive with isocyanate moieties of the at least one diisocyanate,

wherein the energetic thermoplastic elastomer has a density ranging from approximately 1.31 g/cm³ to approximately 1.42 g/cm³.

44. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 43, wherein:

the at least one diisocyanate contains a first isocyanate moiety which is at least five times more reactive with the terminal groups of the A blocks and the B blocks than a second isocyanate moiety thereof, ~~whereby~~ wherein the more reactive first isocyanate moiety is capable of reacting with and end capping the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

the at least one linking compound has two isocyanate-reactive groups which are sufficiently sterically unhindered to be reactive with the free and unreacted second isocyanate moieties of the end-capped blocks.

45. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 44, wherein the at least one diisocyanate comprises 2,4-toluene diisocyanate.

46. (Currently Amended) ~~An~~ The energetic thermoplastic elastomer as defined in claim 43, wherein the B blocks comprise difunctional glycidyl azide polymer.

47. (Currently Amended) ~~A-~~The energetic thermoplastic elastomer as defined in claim 43, wherein the B blocks comprise poly(glycidyl nitrate).

48. (New) The energetic thermoplastic elastomer of claim 1, wherein the A blocks terminated with isocyanate-reactive groups derived from monomers comprise at least one member selected from the group consisting of 3,3-bis(ethoxymethyl)oxetane, 3,3-bis(chloromethyl)oxetane, 3,3-bis(methoxymethyl)oxetane, 3,3-bis(fluoromethyl)oxetane, 3,3-bis(acetoxymethyl)oxetane, 3,3-bis(hydroxymethyl)oxetane, 3,3-bis(methoxyethoxymethyl)oxetane, 3,3-bis(iodomethyl)oxetane, 3,3-bis(nitratomethyl)oxetane, 3,3-bis(methylnitraminomethyl)oxetane, and 3,3-bis(azidomethyl)oxetane.